

# CLAIMS

We claim:

1. A fuel additive composition intended to be incorporated in commercially available liquid hydrocarbon fuel at a dose ratio such that additional water in such fuel after incorporation comprises from 5 to 95 ppm by weight in said hydrocarbon fuel, said additive comprising:

from 10% to 65% by weight of water;

from 0% to 25% by weight of one or more co-surfactants selected from the group consisting of alcohols,

the balance up to 100% by weight of one or more surfactants selected from the group consisting of amphoteric, anionic, cationic and non-ionic surfactants such that the ratio of said surfactant to said water falls within the range from 0.5:1 up to 8.0:1.

2. The fuel additive composition of claim 1, in which said ratio of said surfactant to said water being in the range from 1.0:1 to 3.0:1.

3. The fuel additive composition of claim 1, in which said one or more surfactants is selected from the group consisting of amine alkylbenzene sulphonate, POE (20) sorbitan monooleate, tall oil fatty acids, oleyl imidazoline hydrochloride and oleamide diethanolamine.

4. The fuel additive composition of claim 1, in which said one or more co-surfactants is selected from the group consisting of C<sub>1</sub> to C<sub>4</sub> alcohols, ethylene glycol and glycol ethers.

a' 5. A method of producing a fuel additive composition intended to be incorporated in commercially available liquid hydrocarbon fuel at a dose ratio such that additional water in such fuel after incorporation comprises from 5 to 95 ppm by weight in said

hydrocarbon fuel, said additive composition produced by mixing the following components:

*a1 cont.*

from 10% to 65% by weight of water;  
from 0% to 25% by weight of one or more co-surfactants selected from the group consisting of alcohols,  
the balance up to 100% by weight of one or more surfactants selected from the  
group consisting of amphoteric, anionic, cationic and non-ionic surfactants such that the  
ratio of said surfactant to said water falls within the range from 0.5:1 up to 8.0:1.

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6. The method of claim 5, in which said ratio of said surfactant to said water falls within the range from 1.0:1 to 3.0:1.

7. The method of claim 5, in which said one or more surfactants is selected from the group consisting of amine alkylbenzene sulphonate, POE (20) sorbitan monooleate, tall oil fatty acids, oleyl imidazoline hydrochloride and oleamide diethanolamine.

8. The method of claim 5, in which said one or more co-surfactants is selected from the group consisting of C<sub>1</sub> to C<sub>4</sub> alcohols, ethylene glycol and glycol ethers.

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9. A liquid fuel composition comprising a liquid hydrocarbon fuel mixed with a micro-emulsion forming additive comprising:

from 10 to 400 ppm of one or more surfactants selected from the group consisting of amphoteric, anionic, cationic and non-ionic;

from 0 to 100 ppm of one or more co-surfactants selected from the group consisting of alcohols, glycols, and ethers;

from 5 to 95 ppm of added water with the ratio of surfactant to added water being in the range from 0.5:1 to 8.0:1; and

*a2*  
the remaining portion being said liquid hydrocarbon fuel.

10. The fuel composition of claim 9, in which said added water is in the range of 25 to 50 ppm.
11. The fuel composition of claim 9, in which said ratio of surfactant to added water being in the range of 1.0:1 to 3.0:1.
12. The fuel composition of claim 9, in which in which said one or more surfactants is selected from the group consisting of amine alkylbenzene sulphonate, POE (20) sorbitan monooleate, tall oil fatty acids, oleyl imidazoline hydrochloride and oleamide diethanolamine.
13. The fuel composition of claim 9, in which said one or more co-surfactants is selected from the group consisting of C<sub>1</sub> to C<sub>4</sub> alcohols, ethylene glycol and glycol ethers.

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14. A method of producing a micro-emulsion liquid fuel composition comprising:  
selecting a quantity of liquid hydrocarbon fuel from the group boiling in the gasoline to diesel fuel range;

adding to said fuel a micro-emulsion forming additive comprising:

from 10 to 400 ppm of one or more surfactants selected from the group consisting of amphoteric, anionic, cationic and non-ionic;

from 0 to 100 ppm of one or more co-surfactants selected from the group consisting of alcohols, glycols, and ethers;

from 5 to 95 ppm of added water with the ratio of surfactant to added water being in the range from 0.5:1 to 8.0:1; and

the remaining portion being said liquid hydrocarbon fuel.

15. The method of claim 14, in which said added water is in the range from 25 to 50 ppm.

16. The method of claim 14, in which said ratio of surfactant to added water is in the range from 1.0 :1 to 3.0:1.

17. The method of claim 14, in which said one or more surfactants is selected from the group consisting of amine alkylbenzene sulphonate, POE (20) sorbitan monooleate, tall oil fatty acids, oleyl imidazoline hydrochloride and oleamide diethanolamine.

18. The method of claim 14, in which said one or more co-surfactants is selected from the group consisting of C<sub>1</sub> to C<sub>4</sub> alcohols, ethylene glycol and glycol ethers.

19. The fuel additive composition of claim 1 wherein the liquid hydrocarbon fuel is gasoline.

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